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UNDER THE DIRECTION OF THE COMMITTEE OF GENERAL LITERATURE AND EDUCATION, APPOINTED BY THE SOCIETY FOR PROMOTING CHRISTIAN KNOWLEDGE.

SKETCHES OF NEW SOUTH WALES. No. XIV.

On the Animals called "Monkeys," in New South Wales.

These animals are common in New South Wales, and the accompanying sketch is a correct representation of one of them. They are generally found in thick stringy-bark forests, and are numerous on the ranges leading to Cox's River, below the mountain precipices, and also in the ravines which open into the Hawkesbury River, as well as in various other parts of the colony. They are called by some monkeys, by others bears, but they by no means answer to either species. I first took them to be a species of the sloth of Buffon, and so they might be, though they differ also in many respects from that animal; and I now think that these animals mostly resemble, and come nearest to, the loris, or slow-paced lemur of India.

Having shot several, and caught them occasionally (with the assistance of the natives) alive, both young and old, which I have kept at the tents for some time, I am able, from what I have observed, to give the following description. They have four hands, having naked palms, which are armed with crooked pointed nails, exceedingly sharp, and rather long. They are covered with fur of a bluish-gray colour, very thick, and extremely soft. It is darker on the back, and paler under the throat and belly, but slightly tinged with a reddish-brown about the rump.

The nose is somewhat elongated, and appears as if it was tipped with black leather. The ears are almost concealed in the thickness of the fur, but have inwardly long whitish hairs. The eyes are round and dark, sometimes expressive and interesting. The mouth is small, and they have no tail. Their countenance altogether is by no means disagreeable, but harmless-looking and pitiful. They seem formed for climbing trees, but they are rather slow in motion, and but moderately active. Like many other animals of the colony, they are drowsy and stupid by day, but become more animated at night, and when disturbed they make a melancholy cry, exciting pity. They feed upon the tops of trees, selecting the blossoms and young shoots; and they are also said to eat some particular kinds of bark. When full-grown, they appear about the size of a small Chinese pig. They are certainly formed differently from every other species of the quadrumana, and it is probable they possess different enjoyments. They are very inoffensive and gentle in manners, if not irritated. The first I ever saw of these animals was caught in a particular manner by a native, and as we witnessed his manœuvres with considerable curiosity, it may afford some interest to relate the anecdote.

We were ascending very early in the morning Mount Tourang, one of the trigonometrical stations in Argyle. When the native perceived a very large monkey in the act of ascending a tree, he caught it, and being desirous of preserving the animal, we tied it with some silk kerchiefs to the trunk of a small tree, intending to take it to the camp on our return. About sunset we were descending the mountain, and did not forget the prisoner; but, lo! on arriving at the spot the creature was gone. The native shook his head, whistled, and commenced examining the neighbouring trees, when presently he espied the animal perched upon the top of a high tree, quite at home. "Me catch the rascal directly," said the black, and proceeded first to cut a thin pole about ten feet in length. He next tore a long strip of ropy bark, which he fastened to one end of the pole, in the form of a loop or noose, after which he commenced climbing the tree in good spirits, and confident of success. The animal, on observing the approach of his enemy, ascended higher and higher till he reached the very extremity of the leafy bough on the top of the tree: while the native, mounting as high as he could safely go, could but scarcely reach him with his pole. For a long time he tried to get the noose over the head of the monkey, and several times when the native imagined he had succeeded, the monkey, at work with his fore-hand, would repeatedly tear it off and disengage himself. The poor animal, as he looked down upon his perplexing adversary, looked truly piteous and ridiculous, and we began to think that the black would fail in his attempt.

The native, however, growing impatient and angry, ascended a step higher, till the very tree bended with his weight. He tried again, and having succeeded in slipping the noose over the monkey s head, immediately twisted the pole so as to tighten the cord. "Me got him rascal," he exclaimed, as he looked downward to see the best way of descending. "Come along, you rascal, come, come, come," he cried, tugging away at the monkey, who seemed unwilling to quit his post. Down they came by degrees, the black cautiously managing his prisoner, every now and then making faces at him and teasing him, with great apparent delight and satisfaction to himself. We could not but observe the cautious manner in which he appeared at times to treat the monkey but this caution we soon perceived was very necessary, for when they had descended to where the tree divided into two branches, the black endeavoured to make the animal pass him, so that he might have better command over him. In so doing the monkey made a sort of spiteful catch or spring at the native, but which he cleverly avoided by shifting himself to the other branch with great dexterity. At length, however, both the man and the monkey arrived nearly to the bottom of the tree, when the latter, being lowermost, jumped upon the ground, got loose and having crawled to the nearest tree, commenced ascending again. We seized him by the rump, thoughtless of danger, but soon thought it advisable to quit our hold, when the native, now enraged, sprung to his tomahawk, and threw it with such force at the unlucky animal as to knock him clean off the tree. We took the animal to the camp, where it was soon despatched, as we thought, from its pitiful cries, that it was suffering torture from the blow of the tomahawk. W. R. G.

THE VASTNESS OF THE UNIVERSE.

IT is extremely difficult to devise any means of bringing before a common apprehension, the scale on which the universe is constructed, the enormous proportion which the larger dimensions bear to the smaller, and the amazing number of steps from large to smaller, or from small to larger, which the consideration of it offers. The following comparative representations may serve to give the reader, to whom the subject is new, some idea of these steps.

If we suppose the earth to be represented by a globe a foot in diameter, the distance of the sun from the earth will be about two miles; the diameter of the sun, on the same supposition, will be something above one hundred feet, and, consequently, his bulk such as might be made up of two hemispheres, each about the size of the dome of St. Paul's. The moon will be thirty feet from us, and her diameter three inches,—about that of a cricket-ball. Thus the sun would much more than occupy all the space within the moon's orbit. On the same scale, Jupiter would be above ten miles from the sun, and Uranus forty. We see then how thinly scattered through space are the heavenly bodies. The fixed stars would be at an unknown distance; but, probably, if all distances were thus diminished, no star would be nearer to such a one-foot earth than the moon now is to us.

On such a terrestrial globe, the highest mountains would be about one-eightieth of an inch high, and, consequently, only just distinguishable. We may imagine, therefore, how imperceptible would be the largest animals. The whole organized covering of such an earth would be quite undiscoverable by the eye, except perhaps by colour, like the bloom on a plum.

In order to restore the earth and its inhabitants to their true dimensions, we must magnify the length, breadth, and thickness of every part of our supposed models, forty millions of times; and to preserve the proportions, we must increase equally the distances of the sun and the stars from us. They seem thus to pass off into infinity, yet each of them thus removed has its system of mechanical, and perhaps of organic processes, going on upon its surface.

But the arrangements of organic life which we can see with the naked eye are few, compared with those which the microscope detects. We know that we may magnify objects thousands of times, and still discover fresh complexities of structure: if we sup

pose, therefore, that we thus magnify every member of the universe, and every particle of matter of which it consists, we may imagine that we make perceptible to our senses the vast multitude of organized adaptations which lie hid on every side of us; and in this manner we approach towards an estimate of the extent through which we may trace the power and skill of the Creator, by scrutinizing his work with the utmost subtlety of our faculties.

[Whewell's *Bridgewater Treatise.*]

RAVAGES OF INSECTS.

Few persons are aware of the extraordinary influence which even the smaller animals have on plants, and of the important service afforded to the vegetable kingdom, in maintaining a due balance of the various species, by the apparent desolation caused by animals; for here the most extensive havoc is often, like the fire of London, a most extensive blessing. Of these services, insects perhaps afford the most numerous and remarkable illustrations.

There is scarcely a plant that is not the peculiar *habitat* of one or more distinct species, and often the same plant is infested by several species. The oak is frequented by a variety of other insects besides the numerous species of *Cynips*, nor is this a solitary example, for it happens also to other plants. Furthermore, the insects themselves, or the diseases they produce, frequently become very important articles of food, medicine, and commerce: for example, the *Coccus* (the cochineal insect), the *Lac* insect* and the *Cantharis* (Spanish fly), the gall-apples of the *Salvia pomifera* (the apple-bearing sage), and the nut-galls of the Levant.

Ample as is the field, few and short are the examples which space will suffer us now to give; and it is to the less pleasing and apparently less profitable, although, on the whole, not less important duties of insects, that the present paper will be devoted. There is truly something quite wonderful in the contemplation of the devastating power of agents that seem so insignificant; something which is, perhaps, more impressive and appalling than when the causes are apparently more equal to the effects.

When pestilence depopulates a land,—when barbarian hordes lay waste the fertile plains of civilized communities,—when savage beasts devour and destroy flocks, herds, and harvests,—when floods, earthquakes, and volcanoes, submerge, ingulf, or bury towns, men, and plains,—awful as are the results, still there is something less bewildering, less astounding, in the contemplation of such catastrophes, dreadful as they are, because there would, in such cases, seem to be a more natural consistency between the deeds and the agents by which they have been done, than when we consider that creatures so small as locusts can strip, during one visitation, whole forests of their foliage, and destroy every trace of vegetation throughout an extent of several thousand square miles together; and, as was the case when the kingdom of Masinissa was thus scourged, cause upwards of 800,000 persons to die from famine. What are the ravages of beasts,—what the desolation even of earthquakes and volcanoes, when compared to such an unsparing annihilation of men, brutes and plants, by these powers of the air!

Neither is our astonishment lessened, although its course be turned, when we compute their sums, when we find the swarms of these insects to be so vast and dense as to overshadow large tracts of country, and even to intercept the light of day. One of these living clouds, which was three whole days and nights, without apparent intermission, passing over Smyrna, must have been, according to accurate observations made at the time, three hundred yards in depth, upwards of forty miles in width, and nearly five hundred miles in length. Captain Basil Hall calculated, "that the lowest number of locusts in this enormous swarm must have exceeded 168,608,563,200,000;" and, "in order to assist the imagination, Captain Beaufort determined that this cloud of locusts, which he saw drifting by when he lay at Smyrna, if formed into a heap, would have exceeded in magnitude more than a thousand and thirty times the largest pyramid of Egypt*; or, if they had been placed on the ground close together, they would have encircled the globe with a band a mile and a furlong wide!" Indeed, history tells us, that when these conquering legions are subdued by tempests, their bodies occasionally overspread large tracts of country, even to four feet in depth, and when driven into the sea, have formed a bank along the shore, three or four feet in height, and extending for fifty miles.

But we need not confine ourselves to foreign illustrations; for we do not lack examples nearer home of somewhat analogous, though far less fatal visitations, as the *Aphides* (or rose-bugs) and *Coccinellæ* of our hop-plantations, the flies of our turnip-fields†, and the timber-grubs of this and other European countries, will sufficiently declare. The *Cossus ligniperda*, or Great Goat Moth, is a most powerful and destructive instrument in the hands of Nature, and the rapidity with which this power is developed forms one of the not least interesting points of consideration. The larvæ of this insect have been proved by experiment to increase their weight 140 times in an hour, and, when full grown, to be 72,000 times heavier than when hatched from the egg. The willows near London, especially in the neighbourhood of Hackney, have suffered much within the last few years from the depredations of this insect; but its ravages, and the rapidity of its increase, are nothing in comparison to those of the *Termes bellicosus*, which lays sixty eggs per minute, and will continue this operation for an almost incredible time, with scarcely any intermission; so that, at this rate, one female might lay 3,600 eggs per hour, or 86,400 in a day. Even a single female of the common *flesh-fly*, which is not the most prolific of its class, will give birth to 20,000 young; so that, as has been observed, there is some ground for the assertions of Linnæus and Wilcke, that three flies of *Musca vomitoria* could devour a dead horse as quickly as a lion; and that even the smallest insects can commit, when required, more ravages than an elephant, or any of our largest beasts. The importance of these scavengers of nature in removing suddenly effete and useless matter, will be acknowledged on every hand; but although they are employed with much advantage in alternating crops of trees and herbs in forest, grass, and other lands, yet, when they encroach on cultivated grounds, the injury which they commit is lamentable in the extreme.

Several instances immediately in point have been recorded by Mr. Brayley, in his *Essay on the Utility of a Knowledge of Nature*; he says, "The pine-forests of Germany have at various times sustained enormous injury from the attacks of a small beetle, called *Bostrichus typographus*, 80,000 larvæ having been found in one tree; and, as they feed on the soft inner bark, and multiply thus abundantly, whole

* See *Saturday Magazine*, Vol. VI., p. 116.

* See *Saturday Magazine*, Vol. I., p. 137.
† Ibid, Vol. VII., p. 181.

forests fall a sacrifice to their voracity, so that, in the Hartz alone, the trees destroyed were calculated at a million and a half; and the inhabitants of this extensive range of country were threatened with a want of fuel to continue their mining and smelting operations, and consequently with ruin, entirely dependent as they were upon those branches of the useful arts." Subsequently these *Bostrichi*, when arrived at their perfect state, in the form of winged beetles, migrated in swarms into Suabia and Franconia, there to commit similar ravages. At length, after repeated injuries, the powers of nature interfered to mitigate the evil, which want of scientific knowledge, as we shall presently show, had allowed to gain so alarming a head. Between 1784 and 1789, in consequence of a succession of cold and moist seasons, the numbers of this scourge were sensibly diminished: it appeared again, however in 1790; and, so late as 1796, there was great reason to fear for the few fir-trees that were left.

About sixteen years ago, the elm-trees in St. James's and Hyde Parks suffered much from a similar attack, and whole rows were rapidly being thinned and disappearing, both in the Mall and the Birdcage Walk. "As the persons who had the charge of the plantations were entirely ignorant of the true cause of the mischief, and as it was clear that the trees died in consequence of being completely stripped of their bark, rewards were at first offered for the discovery of the delinquents who so mischievously barked them; but these were offered in vain. It was observed, however, (and the observation claims some credit for its ingenuity,) that no more of any tree was barked from the ground than what was easily within the reach of a soldier's bayonet; and this was sufficient to throw suspicion on some unfortunate recruits, of whom more than one was arrested, without producing any diminution of the evil. In vain, too, were persons employed to sit up during whole nights, watching for the enemy; the bark continued to be found every morning at the roots of the trees, and the park-keepers, after all their trouble, could only conclude 'that the bark fell off in consequence of something being placed on the trunks in the daytime.' About the same time, the elms in the Grove at Camberwell, near London, were observed to be undergoing a similar process of destruction; and the proprietors being equally ignorant of its cause as in the instance just mentioned, the injury was ascribed to the effects of gas escaped from the pipes for lighting the road, which had just been laid down, and legal proceedings were actually commenced for the removal of the nuisance, against the gas-company which had undertaken the supply." Entomologists, it is true, were aware that the operations of insects were the cause of all this mischief; but unfortunately they were not believed, until the disease had reached that pitch which threatened to make remedy hopeless. But at last a naturalist was consulted, and he at once discovered that an insect, called the *Hylesinus destructor*, had taken up its abode in the Parks, and legions of these little fellows were quietly and constantly at work, secretly proceeding in their labours of destruction, in spite and in defiance of Lord Sydney's denunciations. But not only did Mac Leay discover the cause of this evil: he, in the true spirit of philosophy, likewise directed a remedy to be applied, and these subtle miners became at once obedient to the voice of science, although they had defied the Ranger's threats to prosecute them with the utmost severity of the law. B.

ON CARBON, AND THE CONVERTIBILITY OF MATTER.

THE subjects named at the head of this paper, form part of a course of Lectures recently delivered at the London Institution, by Professor Brande, F.R.S., on "Chemistry, as applied to the Diet of Man," in which he brings forward information of the most interesting, and, in some cases, novel description, tending to show the intellectual design and Divine economy of the universe. We propose to give, with a few additions, some of his remarks on Carbon, and the Convertibility of matter.

There are at present about fifty-four substances known as elementary, by chemists, of which number there are only four which enter generally into bodies. These are, Oxygen, Hydrogen, Carbon and Nitrogen. But of these four, there is but one which is found universally in the composition of the material world;—this one is Carbon. Under these circumstances, it is clear that carbon must assume every variety of form and appearance. It constitutes one-half of the vegetable kingdom; it bears a large proportion in the mineral world; it enters largely into the animal system; in a less degree, it contributes to the formation of the air we breathe; and mixed with spring-water, gives it its agreeable briskness.

The purest form of carbon we are acquainted with is the diamond; the next substance in purity is wood charcoal. Humanly speaking, carbon is quite indestructible: it is true we may alter its *form*, changing the brilliant adamant into an invisible gas, but still not a particle is lost; and if charcoal were heated for centuries, in a vessel from which the air is excluded, no change would be perceptible.

We may here observe the much greater difficulty attending the synthesis of bodies, than their analysis. While the generality of substances may be submitted to analytical processes, there are numerous inorganic bodies that resist all the chemist's efforts in the converse operation*; and with regard to the different forms of organized matter, he finds himself quite incapable of bringing back that of which he knows the exact component parts, and which he found no difficulty in decomposing. We may reduce sugar into its constituents of charcoal and water with ease, but not with all the perseverance and versatile expedients of the alchemist, can we succeed in re-forming sugar. No; nature carries on her operations in a laboratory to which man may not have access. We cannot imitate or, supersede the vital principle in the sugar-cane, and we must make our ambition halt before the barrier it cannot surmount.

It appears to be a law of nature, that inorganic matter shall pass very slowly and gradually into

* Modern discovery is making rapid steps in this branch of science. Sir Humphry Davy, by a strong and long-continued current of the voltaic fluid, succeeded in producing a substance from a point of carbon, resembling in many respects the diamond. Its form was crystalline, and it possessed sufficient hardness to scratch glass; but it was black and opaque. We give an extract from a report of the proceedings of the late meeting at Bristol of the British Association, which will be found interesting in its details. "Mr. Cross stated he had devoted much of his time to electricity, and he had latterly been occupied in improvements in the voltaic power, by which he had succeeded in keeping it in full force for twelve months by water only, rejecting acids entirely. Mr. C. stated that he had obtained water from a finely crystallized cave at Holway, and, by the action of the voltaic battery, had succeeded in producing from that water, in the course of ten days, numerous rhomboidal crystals, resembling those of the cave. In order to ascertain if light had any influence in the process, he tried it again in a dark cellar, and produced similar crystals in six days, with one-fourth of the voltaic power. He had repeated the experiment a hundred times, and always with the same results. He was fully convinced that it was possible to make even diamonds, and that at no distant period, every kind of mineral would be formed by the ingenuity of man. By a variation of his experiments he had obtained gray and blue carbonate of copper, phosphate of soda, and twenty or thirty other specimens."

organized bodies. Valuable as the diamond is esteemed, we should find but a starving prospect, were we put on a regimen of diamonds: and yet it is possible, that substances almost as valuable are finding their way into our system, and forming part of it.

I have said that the conversion of matter is gradual, that is, that the substance to be taken up must pass through some of the lower steps in the scale of nature, before it can make part of the composition of the more perfect grades. We will suppose, for example, that a chemist decomposes a diamond; the gas immediately combines with the oxygen of the air, and forms carbonic acid gas;—this floats about, till some plant, perhaps, absorbs it, by means of its pores, its vessels, and ducts. Let us imagine the plant so receiving it to be grass,—that this grass is devoured by an ox, and that you or I partake of the flesh of the animal; the food becomes converted into chyme, then into chyle, and is subsequently pumped up by the absorbing vessels into the heart: and thus a diamond is contributing to form part of our flesh, blood, and nerves.

But the process of decomposition in the mineral kingdom is very slow in operation; and plants evince the same partiality for organized matter as the members of the animal kingdom: they derive a great part of their sustenance from former vegetable matter, now in a state of decomposition, and, therefore, in a fit condition for their use. The simplest forms in the vegetable world procure subsistence immediately from decomposed minerals. When a new surface of rock becomes exposed to the air, a very short period elapses before some lichens and mosses appear on its face; these assisting the decomposition, and themselves decomposing, form a pabulum for plants of a more perfect growth, and at length the tall palm and the sturdy oak spread forth their branches, and wave in the wind, where before there was only a naked and frowning rock. Still, however, considering that one-half of the vegetable kingdom is constituted of carbon, we are at a loss to account for its production in such enormous quantities. One year's harvest of wheat, in England, must contain thousands of tons of charcoal: then look at the plantations of sugar, of tea, coffee, cotton, of timber, and all the other vegetable necessaries. Vegetation round the metropolis is abundant and luxuriant in a very high degree, and this has been stated to arise from the immense quantities of carbon given out into the atmosphere, by the burning of coals in London, as well as from the breath sent forth from the lungs of its inhabitants*. Carbonic acid gas is the heaviest of aëriform substances, and its tendency is to settle in the lowest situations it finds: this circumstance would be entirely destructive to vitality, were it not counteracted by another tendency, which causes it to mix readily with atmospheric air, by which means the lower part of the atmosphere contains no greater proportion of this gas than the uppermost strata.

We now come to speak of the convertibility of one form of organized matter into another.

Carbon unites with oxygen and hydrogen, (the two latter in the same proportions as form water,) to produce the following substances, called proximate principles: the integer of each being divided into 100 parts.

Carbon		Water.	
40	+	60	Sugar.
41	+	59	Starch.
42	+	58	Gum.
47	+	53	Acetic acid.
50	+	50	Lignum, or wood.

By a series of experiments, in which heat and sulphuric acid were the agents, Mr. Braude converted starch into gum, paper (woody fibre) into gum, wood into acetic (pyroligneous) acid, woody fibre into gelatine, starch into sugar, and wood into starch. Of these results, the most important are the convertibility of starch into sugar, and wood into starch, for by the last he produced *bread*. The principal ingredient of flour is starch, the others being gluten, (a very peculiar substance,) a minute portion of sugar and of gum. In converting wood, therefore, into starch, it is, in fact, converted into the principal constituent of bread.

Necessity has often proved the mother of invention. When the supply of sugar was partially cut off from the West India Islands to Russia, a chemist of St. Petersburgh, directing his attention to the subject, obtained this result, that a pound of starch will yield more than a pound of sugar†. The process is simple. Starch is to be diluted with water, and kept boiling for many hours: or the experiment may be hastened by the addition of a few drops of sulphuric acid, and this may be neutralized by an alkali.

It is not necessary, however, that either heat or acid should be employed; simply letting starch and water stand together, will produce the effect; 100 parts of starch, to which 1200 parts of water were added, and the mixture then allowed to remain, yielded in two months,

Sugar	48	parts
Gum	24	„
Starch	22	„
	94	
Loss	6	„
	100	

The bread was made from fine beechen saw-dust, (beech wood containing very little tar,) carefully roasted till it assumed a pale-brown colour; it was then kneaded up with yeast in the common way, and baked. Its appearance was much the same as the oaten bannocks of Scotland, but rather darker.

These changes are not difficult to account for. On reference to the table given above, it will be seen what a small difference exists in the elementary formation of these apparently so dissimilar substances; and if this slight difference can be broken down—as it is by the application of heat or an acid—the substance is converted from the one to the other.

It is by the abstraction of carbon and oxygen that the conversion is effected, thereby leaving a greater relative quantity of hydrogen. Carbon, however, cannot be *added*, so as to produce a substance in the opposite order of the scale.

Mr. Brande remarked, that he considered the convertibility of *wood* into *bread* as a manifestation of Providence, in providing against the effects of famine —taken in the severest sense of the word. He pronounced the bread to be not unpalatable, and better than that used by the peasantry in some of the northern parts of Europe, and which is made principally from the bark of trees and from roots. M. H.

* Allen and Pepys found by experiment, that the quantity of carbonic acid gas emitted from the lungs of a healthy person in twenty-four hours is about 40,000 cubic inches, equivalent to eleven ounces of solid carbon. Computing the number of inhabitants at a million and a half, there will at this rate be upwards of 460 tons of solid carbon expired in twenty-four hours, in London!

† Nearly all vegetable substances contain more or less saccharine matter. The French manufacture a considerable proportion of the sugar used in France from the beet-root. In all cases where sugar is produced, it arises from a partial conversion of the woody fibre during the progress of the first, or saccharine fermentation.

STORY OF AN ELECTRIC EEL*.

THE governor at New Amsterdam has a large electric eel, which he has kept for several years in a tub, made for that purpose, placed under a small shed near to the house. This fish possesses strong electrical powers, and often causes scenes of diversion among the soldiers and sailors, who are struck with astonishment at its qualities, and believe it to be in league with some evil spirit. Two sailors, wholly unacquainted with the properties of the animal, were one day told to fetch an eel, which was lying in the tub in the yard, and give it the cook to dress for dinner. It is a strong fish, of seven or eight pounds' weight, and gives a severe shock on being touched, particularly if at all irritated or enraged. The sailors had no sooner reached the shed, than one of them plunged his hand to the bottom of the tub to seize the eel; when he received a blow which benumbed his whole arm: without knowing what it was, he started from the tub, shaking his fingers, and holding his elbow with his other hand, crying out, "I say, Jack, what a thump he fetched me with his tail!" His messmate, laughing at "such a foolish notion," next put down his hand to reach out the eel, but receiving a similar shock, he snapped his fingers likewise, and ran off, crying out, "Why, he did give you a thump! He's a fighting fellow: he has fetched me a broadside too! Let's both have a haul at him together, Jack: then we shall board his slippery carcass, spite of his rudder." Accordingly they each plunged their hands into the tub, and seized the fish, by a full grasp round the body. This was rougher treatment than he commonly experienced, and he returned it with a most violent shock, which soon caused them to quit their hold. For a moment they stood aghast, then rubbing their arms, holding their elbows, and shaking their fingers, they capered about with pain and amazement, swearing that their arms were broken, and that it was the devil in the tub in the shape of an eel. They now perceived that it was not a simple blow of the tail which they had felt before; nor could they be prevailed upon to try again to take out the fish, but stole away, rubbing their elbows, and abusing "the trick about the cook and the eel."

The form of this fish is not so round as that of the common eel. The head is flatter, as is likewise the tail, and much broader; the sides are less convex and deeper; the back is wide, and the body tapers down somewhat abruptly, terminating at the belly in a thin membrane, forming a kind of fin. The shock communicated is sometimes very powerful, and precisely resembles that from the electrical machine, and may be received both from contact, and by means of conductors. This fish once gave me a severe blow from touching it, in the water, with the end of a polished ramrod.—PINCKARD'S *Notes on the West Indies.*

* See *Saturday Magazine*, Vol. IV., p. 144.

THE HUMAN HAND,

CONSIDERED AS A MORAL ORGAN.

MAN takes his particular denomination from the hand. He is the only *Bimane.* I shall not here say anything on its structure and its uses: but as it has not been treated of as a *moral* organ: as being in intimate connexion with the heart and affections; as their principal index and premonstrator; and as the mighty instrument by which a great part of the physical good and evil which befalls our race is wrought, I may be permitted to make a few observations upon it as far as these are concerned.

God made the body in general a fit machine, not only to execute the purposes of its immaterial inhabitant, the soul; but, in some sort, he made it a mirror to reflect all its bearings and character; to indicate every motion of the fluctuating sea within, whether its surges lift themselves on high, elevated by the gusts of passion; or all is calm, and tranquil, and subdued. No one of the bodily organs, by its structure and station in the body, is so evidently formed in all respects for these functions as the HAND. The eye, indeed, is, perhaps, the most faithful mirror of the soul's emotion; yet though it may best portray and render visible the internal feeling, it can in no degree execute its biddings; but the hand is the great agent and minister of the soul, which not only reveals her inmost affection and feeling, and, in conjunction with the tongue,—and these two in connexion are either the most beneficent or maleficent of all our organs,—declares her will and purpose; but is also employed by her to execute them. Thus HEART and HAND, the principle and the practice, have been united, in common parlance, from ancient ages. The earliest dawn of reason in the innocent infant is shown by the signs it makes with its little *hands;* by them it prefers its petitions for anything it desires; and, in imitation of this, God's children are instructed *to lift up holy hands* in prayer. Love, friendship, charity, and all the kindly affections of our nature, use the hands as their symbol and organ; the fond embrace, the hearty shake, the liberal gift, are all ministered by them. Joy, gladness, applause, welcome, valediction, all use these organs to represent them. Penitence smites her breast with them; resignation clasps them; devotion and the love of God stretches them out towards heaven.

But the hands are not employed to express only the kindly affections of the soul. Those of a contrary and less amiable character use them as their index. Anger threatens, and more violent and hateful passions destroy by them. They are, indeed, the instruments by which a great portion of the evil, and mischief, and violence, and misery, that our corrupt nature has introduced into the world, are perpetrated.

The hand also, on some occasions, becomes the spokesman instead of the tongue. The fore-finger is denominated the *index*, because we use it to indicate to another any object to which we wish to direct his attention. By it the deaf and dumb person is enabled to hold converse with others, so as not to be totally cut off from the enjoyment of society; and by it we can likewise mutually communicate our thoughts, when separated by space however wide, even with our Antipodes.

The Deity himself, also, condescends to convey spiritual benefits to his people, by means of the *hands* of authorized persons, as in confirmation and ordination: and the blessed Friend, and Patron, and Advocate, and Deliverer, of our race, when he was upon earth, appears to have wrought most of his miracles of healing by laying on his hands: in benediction also, when children were brought unto him, he laid his hands on them; and at his ascension, he lifted up his hands to bless his disciples.

To enumerate all the modes by which the internal affection of the soul is indicated by the hand, would be an endless task. I shall, therefore, only further observe, that the greater part of the instances I have adduced are natural, and not conventional or casual modes of expressing feeling, as is evident from their being employed, with little variation, in all ages, nations, and states of society.

How grateful, then, ought we to be to our Creator, for enriching us with these admirable organs, which, more than any outward one that we possess, are the immediate instruments that enable us to master the whole globe that we inhabit; not merely the visible and tangible matter that we tread upon, and its furniture and population; but even to take hold, as it were, of the invisible substances that float around it, and to bottle up the lightning and the wind, as well as the waters! Thus, by their means, do we add daily increments to our knowledge and science, and, consequently, power; to our skill in arts, and every allied manufacture and manipulation; to our comforts, pleasures, and everything desirable in life.

[KIRBY'S *Bridgewater Treatise.*]

A STORM IN PORTUGAL.

On leaving Oporto, I rode on through a valley abounding in corn and wild grapes, and there beheld a natural exhibition of the most awful kind. The extreme and long-continued heat that prevailed in Portugal during the summer of 1827, was, I believe, almost unparalleled: the vines were everywhere injured, in some places destroyed, and the agriculture had universally suffered; but during the last two days an evident change had taken place, the weather was becoming more temperate, and clouds of a leaden hue were gradually collecting from all parts of the horizon. They must have concentrated their strength during the night of the 26th (of October), for on the following morning the sky resembled a great sea of ink; deep black masses overhung our heads, gradually sinking lower and lower, and a faint moaning wind alone interrupted the heavy repose that had settled upon the face of the earth. At length the storm burst; not ushered in by any light showers, not even by any warning drops, but descending at once, and vertically, in sheets of water.

I had never seen so fierce a conflict of the elements. Those hills, a few minutes before so destitute of water that I should have hailed with pleasure the most trifling rill, now resounded with the roar of a thousand torrents rushing impetuously into the valley; and my path, which led along a natural channel between two rocks, at once became the main artery that received these tributary streams. As the water was rising fast, and every moment assumed more the character of a raging torrent, I endeavoured to escape from its vortex by turning my mule and retracing my steps; but the strength of the current, and the terror of the animal, when required to stem it, rendered this manœuvre impracticable, and I was therefore obliged to continue my amphibious journey till I found an outlet.

Having extricated myself from this master-stream, I became involved with the lesser streams that, dashing around me, tumbling from crag to crag, and crossing each other in all directions, presented a magnificent scene of uproar and confusion.

I called to the muleteer and Antonio, who had lingered in the rear, to warn them from the main channel, which might have been dangerous to them, and would probably have been fatal to the loaded mules, but my shouts were drowned in the voice of many waters. Some of our baggage was carried off, and had the inundation continued, we must have lost the whole; but fortunately the sky relented, in mercy to a country which had so long withered under its burning eye, and was now visited by a still more tremendous infliction.

[*Portugal and Gallicia*, by an English Nobleman.]

THE NEGROES.

As the condition of the Negroes in the West Indies is daily becoming a subject of greater interest, some account of their manner of life and habits may not be deemed unacceptable. The following details apply to the Island of Barbadoes; but the writer of these lines believes that they will not be found to differ in any great degree from their customs in other islands.

The greater part of the negro population is employed in the cultivation of the sugar-cane, and the manufacture of sugar from its juice. The principal implement of agriculture is the hoe, which is much larger, and more powerful, than the instrument of that name in England, and is used where the spade would be used in this country*. The plough has for some years past been introduced into many parts of the West Indies; but the particular method of planting the canes, renders it impossible that the use of the hoe can be entirely superseded.

The negroes usually commence work about half-past five in the morning, and have an hour allowed for breakfast, and two hours for dinner. During *crop* (or harvest) time, the duration of their work is somewhat prolonged; they are, however, always observed to be more cheerful and happy during that period than during any other. The half of Saturday is allowed them for the cultivation of their own plantations. Every head of a family has a house built and kept in repair at the expense of the proprietor, with a piece of ground attached to it, in which he usually keeps fowls, with a pig, and a goat tied up, and which he cultivates for his own use and profit.

To every full-grown labourer is allowed a pint and a half of corn, or four pounds of *ground-provisions* (potatoes) daily. In addition to these articles, a dressed meal is served out to them on their return from work at noon; half a pint of ginger-tea is given them before they commence work in the morning, and half a pint of rum, molasses and water, during work. They also receive weekly a pound of salt fish, a pint and a half of molasses, and half a pint of salt. On Sundays an additional allowance is provided for them; and at Christmas and Whitsuntide salt beef, or salt pork, is substituted for fish. They usually attend the weekly market, where they sell part of their allowance of provisions, as well as the fowls, goats, and pigs, which they may have raised; and there they furnish themselves with candles, rice, and such other comforts as their means afford.

The heat of the climate under which they live does not admit of the use of warm clothing; such articles of apparel as are necessary, are furnished by the proprietor. On each estate is an hospital, in which the sick are looked after by a nurse, and the constant attendance of a medical practitioner is secured. The smaller children are under the superintendence of a nurse, while their parents are at work in the field.

The negroes are ordinarily a cheerful and contented race; their principal amusement is dancing, in which they indulge themselves weekly, collecting together in large parties, and occasionally issuing *tickets* of invitation. To these parties they resort, decked out in their gayest apparel; coral necklaces and bracelets, and not unfrequently jewels, ornament their necks and arms; and as many of them are adepts in music, little is wanted to complete the hilarity of these cheerful gatherings.

Still, slavery is indeed a bitter state; and, while we rejoice at the bodily comforts enjoyed by our sable fellow-subjects, as Englishmen we anxiously look forward to the time when they may, without any moral convulsion, enjoy the blessings of freedom; as Christians, to their more complete admission to the liberty of the blessed Gospel. Within the last twenty years, great improvements have been introduced into the management of the negro population; great advances have been made in communicating to them a knowledge of the principles of Christianity. Much yet remains to be done; and should the efforts of all those, on each side of the Atlantic, who sincerely desire the physical and moral happiness of the negroes be duly appreciated, and duly seconded, we may hope to see negro emancipation consummated, without the ruin either of the planter or the slave.

F. F. P

* The writer of this article is acquainted with an individual in this country, who ordered a hoe, of the shape and fashion of that used by the negroes, to be made for gardening purposes, considering it a more efficient tool than our ordinary spade.

TANTALLON CASTLE.

.....Tantallon's dizzy steep
Hung o'er the margin of the deep;
Many a rude tower and rampart there
Repelled the insult of the air,
Which, when the tempest vexed the sky,
Half-breeze, half-spray, came whistling by
Above the rest a turret square
Did o'er its gothic entrance bear,
Of sculpture rude a stony shield;
The bloody heart was in the field,
And in the chief three mullets stood,
The cognizance of Douglas' blood.
The turret held a narrow stair,
Which mounted, gave you access where
A parapet's embattled row
Did seaward round the castle go.
Sometimes in dizzy steps descending,
Sometimes in narrow circuit bending,
Sometimes in platform broad extending,
In varying circle did combine
Bulwark, and bartizan and line,
And bastion, tower, and 'vantage coign.
Above the booming ocean leant
The far-projecting battlement;
The billows burst in ceaseless flow
Upon the precipice below.

THE present remains of the Castle of Tantallon give but a poor idea of its former strength and grandeur; but nevertheless it has still, from its extent and situation, a very imposing appearance. The arrangement of the buildings of the fortress is somewhat semi-circular; it stands upon a rocky promontory, overlooking the Firth of Forth, and nearly opposite the celebrated Bass Rock. Three sides are safe from attack on account of impracticable precipices, while that to the landward was formerly fortified by a double ditch and strong outworks. In former times it was thought impregnable, so much so, that there was a common proverb alluding to its strength, "*Ding down, Tantallon; make a brig to the Bass**."

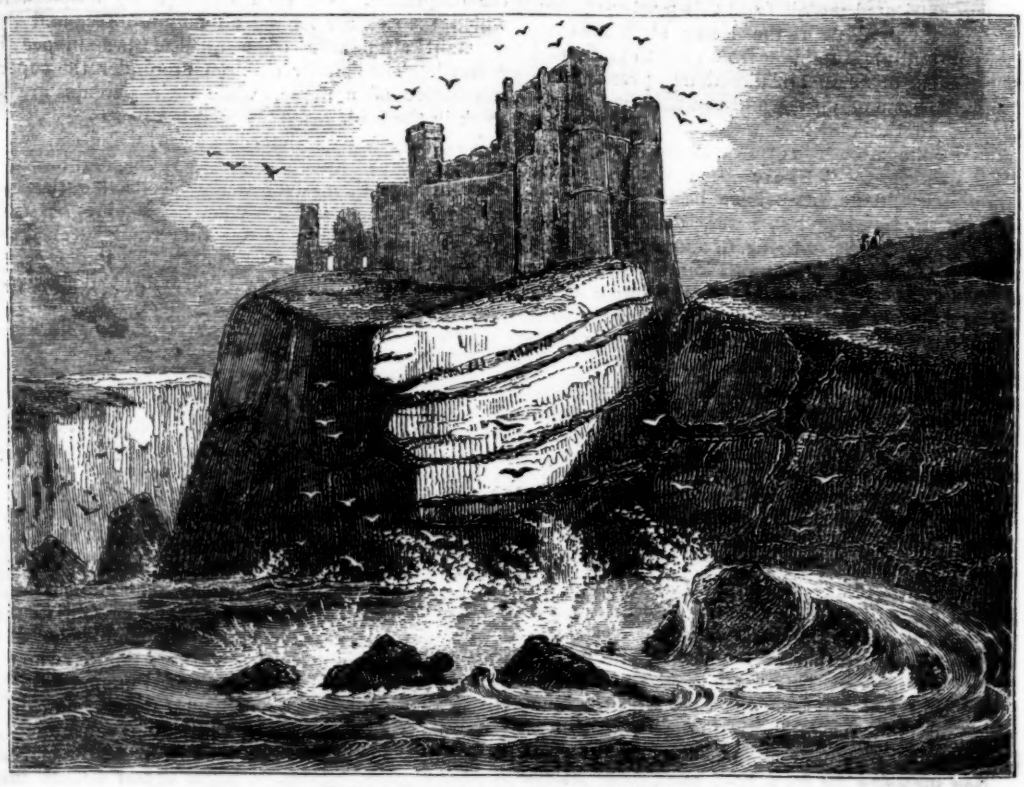
* The rock already described. See *Saturday Magazine*, Vol. IX., p. 186.

both these enterprises being considered impracticable.

Tantallon was a principal castle of the Douglas family, and when the Earl of Angus was banished, in 1527, it continued to hold out against James the Fifth. The king went in person against it, and for its reduction borrowed from the castle of Dunbar, then belonging to the Duke of Albany, two great cannons, whose names, as Pittscottie informs us, with great minuteness, were "Thrawn-mouthed Mow and her Marrow;" also "two great botcards, and two moyan, two double falcons and four quarter falcons;" for the safe guiding and delivery of which three lords were laid in pawn at Dunbar. Yet, notwithstanding all this preparation, James was forced to raise the siege, and only afterwards obtained possession of Tantallon by treaty with the governor, Simeon Panango.

When the Earl of Angus returned from banishment, upon the death of James, he again gained possession of Tantallon: and it actually afforded refuge to an English ambassador, under circumstances similar to those described, in the poem of *Marmion*. This was the celebrated Sir Ralph Sadler, who resided here for some time under Angus's protection, after the failure of his negotiation for matching the infant Mary with Edward the Sixth. He says, that though this place was poorly furnished, it was of such strength as might warrant him against the malice of his enemies, and that he now thought himself out of danger.

The Castle was in later times ruined by the Cromwellians under General Monk, who "dung down Tantallon," its lord, the Marquis of Douglas, being a favourer of the Royal cause. At the beginning of the eighteenth century it was sold to President Dalrymple of North Berwick; at present it belongs to the proprietor of the Bass Rock.



TANTALLON CASTLE, HADDINGTONSHIRE.

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